

Webinar
August 25, 2015

PTWC Enhanced Products for the CARIBE-EWS



Charles McCreery
Director
NOAA Pacific Tsunami Warning Center

Christa von Hillebrandt-Andrade and Carolina Hincapié
Caribbean Tsunami Warning Program

Recommendation ICG/CARIBE-EWS-X

Enhanced PTWC Products for the CARIBE-EWS

The Intergovernmental Coordination Group for the for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS),

Recalling Recommendation [ICG/CARIBE-EWS-IX.7](#) "Enhanced PTWC Products for the CARIBE-EWS",

Acknowledging the scientific and technological advances that have been made since the formation of the CARIBE-EWS to better forecast tsunami impacts in real time and to present forecast information graphically;

Recognizing that PTWC has developed and offered to the CARIBE-EWS a new suite of enhanced operational tsunami forecast products based upon such advances and upon TOWS-WG recommendations for more globally consistent and useful TSP products;

Recognizing that similar products have now been implemented in the Pacific by PTWC for the PTWS and that some Central and South America CARIBE-EWS Member States have coasts in both systems;

Considering that multiple trainings about and exercises using the Enhanced Products have been conducted in the region over the past few years to help prepare Member States for the implementation of these products;

Accepting that the Enhanced Products do not contain alert levels and that Member States will now be fully responsible for tsunami alerts in their own countries and territories according to their SOPs;

Agrees with the PTWC proposed implementation schedule that begins issuance of the Enhanced Products in parallel with current products on 1 October 2015 and fully transitions to the new products on 1 March 2016;

Recommends that additional training on the products be made available prior to full implementation that will at least include several webinars conducted in English, Spanish and French as well as in-person trainings, and encourages Member States and donors to support such trainings;

Recommends that during parallel issuance, all new products be disseminated exclusively by email and only to the designated TWFPs, and National Tsunami Warning Centres (NTWC) and then when fully implemented only the main text product and its derivatives such as an SMS, Facebook, or Twitter statement be distributed more widely via the internet, GTS, AISR/AFTN, and IOC distribution lists, etc.;

Recommends that during the overlap period PTWC generates and sends some sample products by email to the TWFPs and NTWCs, not as an exercise but as a way to aid in preparing for full implementation since the likelihood of having real events during the overlap period is small;

Recommends that in consideration of some TWFP and NTWC internet bandwidth limitations for email, the main text product be sent separately, and that the graphical and statistical products be divided as necessary in emails to minimize their size.

Implementation Schedule

October 1, 2015 – Begin In Parallel with Current Products

- Update the User's Guide for the Enhanced Products
- Issue enhanced products in parallel with current products in the case of an event

October 2015 – February 2016 Simulated Product Tests

- Recognize likelihood of events for which Enhanced Products would be issued
- Issue enhanced products for some simulated events (email)

As of March 1, 2016

- Issue ONLY Enhanced Products

March 17, 2016 – CARIBE WAVE 2016

- Only enhanced products for the two scenarios: Northern Hispaniola and Venezuela

Overview of PTWC Enhanced Products

Paradigm change

- PTWC provides threat forecast
- Countries convert forecast to alert levels

Existing Products

- Text Only
- Single Alert Level (Watch or Nothing)
- ETAs but no Indication of Expected Impacts

Enhanced Products

- Text Message
- Polygons Map of Forecast Threat Levels
- Forecast Deep-Ocean Amplitudes
- Forecast Coastal Amplitudes
- KMZ File of Coastal Amplitudes
- Table of Statistics for Each Polygon

Threshold for Products

October 1, 2015-February 29, 2016

Magnitude Message Type		WMO	AWIPS	NWW	October 1, 2015 - Feb. 29, 2016
≥7.9	Caribbean Sea-wide Tsunami Watch Message	WECA41 PHEB	TSUCAX	HFOTSUCAX	Enhanced Text and Graphical Products will also be Issued (only email)
7.6-7.8	Regional Tsunami Watch Message (sample)	WECA41 PHEB	TSUCAX	HFOTSUCAX	
7.1-7.5	Local Tsunami Watch Message	WECA41 PHEB	TSUCAX	HFOTSUCAX	
6.0-7.0 or 6.5-7.8 in Atlantic	Tsunami Information Statement (sample)	WECA43 PHEB	TIBCAX	HFOTIBCAX	Enhanced text products will also be issued (only email)

Enhanced Text Product

Bulleted format with the following sections

- **Product ID**
- **Message Number, Issued by, Time of Issuance**
- **Headline**
- **Intended Audience**
- **Update(s) in this Message**
- **Preliminary Earthquake Parameters**
- **General Evaluation of Situation**
- **Threat Forecast, as of 2nd bulletin (areas facing >3m, 1-3m, 0.3-1m, <0.3m)**
- **Recommended Actions**
- **Estimated Arrival Times**
- **Description of Potential Impacts**
- **Tsunami Observations**
- **Next Update and Additional Information**

SAMPLE TEXT PRODUCT

Message Number 1

EXPERIMENTAL TSUNAMI MESSAGE NUMBER 1
NOT FOR DISTRIBUTION
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1405 UTC THU MAR 17 2016

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE 8.5
* ORIGIN TIME 1400 UTC MAR 17 2016
* COORDINATES 10.8 NORTH 66.0 WEST
* DEPTH 15 KM / 9 MILES
* LOCATION NEAR THE COAST OF VENEZUELA

EVALUATION

- * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED
NEAR THE COAST OF VENEZUELA AT 1400 UTC ON THURSDAY MARCH 17
2016.
- * BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD
HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

TSUNAMI THREAT FORECAST

- * HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE
WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF

VENEZUELA... BONAIRE... CURACAO... ARUBA... SAINT
VINCENT... GRENADA... PUERTO RICO... SAINT LUCIA... US
VIRGIN ISLANDS... MARTINIQUE... DOMINICA... GUADELOUPE...
DOMINICAN REP... SABA... MONTSEERRAT... SAINT KITTS... SINT
EUSTATIUS... BARBADOS... HAITI... TRINIDAD TOBAGO... SINT
MAARTEN... COLOMBIA... ANGUILLA... ANTIGUA... BR VIRGIN
ISLANDS... BARBUDA... SAINT BARTHELEMY... TURKS N
CAICOS... CUBA... SAINT MARTIN... JAMAICA... BAHAMAS...
PANAMA AND CAYMAN ISLANDS

RECOMMENDED ACTIONS

- * GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS
SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL
POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN
EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.
- * PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT
FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND
LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

- * ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE
FOR PLACES LISTED WITH A POTENTIAL TSUNAMI THREAT. ACTUAL
ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE
LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN
WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
CUMANA	VENEZUELA	10.5N 64.2W	1438 03/17
MAIQUETIA	VENEZUELA	10.6N 67.0W	1448 03/17
ONIMA	BONAIRE	12.3N 68.3W	1455 03/17

SAMPLE TEXT PRODUCT

WILLEMSTAD CURACAO 12.1N 68.9W 1501 03/17
ORANJESTAD ARUBA 12.5N 70.0W 1519 03/17
KINGSTOWN SAINT VINCENT 13.1N 61.2W 1519 03/17
SAINT GEORGES GRENADA 12.0N 61.8W 1519 03/17
CASTRIES SAINT LUCIA 14.0N 61.0W 1524 03/17
FORT DE FRANCE MARTINIQUE 14.6N 61.1W 1527 03/17
ROSEAU DOMINICA 15.3N 61.4W 1529 03/17
BASSE TERRE GUADELOUPE 16.0N 61.7W 1532 03/17
SANTO DOMINGO DOMINICAN REP 18.5N 69.9W 1538 03/17
SABA SABA 17.6N 63.2W 1541 03/17
CABO ENGANO DOMINICAN REP 18.6N 68.3W 1543 03/17
PLYMOUTH MONTERRAT 16.7N 62.2W 1544 03/17
BASSETERRE SAINT KITTS 17.3N 62.7W 1545 03/17
SINT EUSTATIUS SINT EUSTATIUS 17.5N 63.0W 1546 03/17
BRIDGETOWN BARBADOS 13.1N 59.6W 1548 03/17
JACAMEL HAITI 18.1N 72.5W 1552 03/17
PIRATES BAY TRINIDAD TOBAGO 11.3N 60.6W 1553 03/17
SIMPSON BAI SINT MAARTEN 18.0N 63.1W 1554 03/17
RIOHACHA COLOMBIA 11.6N 72.9W 1605 03/17
BARRANQUILLA COLOMBIA 11.1N 74.9W 1611 03/17
PUERTO PLATA DOMINICAN REP 19.8N 70.7W 1613 03/17
THE VALLEY ANGUILLA 18.3N 63.1W 1614 03/17
SAINT JOHNS ANTIGUA 17.1N 61.9W 1618 03/17
PALMETTO POINT BARBUDA 17.6N 61.9W 1624 03/17
SAINT BARTHELEM SAINT BARTHELEMY 17.9N 62.8W 1625 03/17
GRAND TURK TURKS N CAICOS 21.5N 71.1W 1627 03/17
CARTAGENA COLOMBIA 10.4N 75.6W 1628 03/17
CAP HAITEN HAITI 19.8N 72.2W 1629 03/17
SANTIAGO D CUBA CUBA 19.9N 75.8W 1631 03/17
BAIE BLANCHE SAINT MARTIN 18.1N 63.0W 1632 03/17
KINGSTON JAMAICA 17.9N 76.9W 1635 03/17
WEST CAICOS TURKS N CAICOS 21.7N 72.5W 1638 03/17
MAYAGUANA BAHAMAS 22.3N 73.0W 1639 03/17
GREAT INAGUA BAHAMAS 20.9N 73.7W 1642 03/17
ALIGANDI PANAMA 9.2N 78.0W 1645 03/17
BARACOA CUBA 20.4N 74.5W 1647 03/17
MONTEGO BAY JAMAICA 18.5N 77.9W 1647 03/17
CROOKED ISLAND BAHAMAS 22.7N 74.1W 1647 03/17
PORT OF SPAIN TRINIDAD TOBAGO 10.6N 61.5W 1649 03/17
SANTA MARTA COLOMBIA 11.2N 74.2W 1652 03/17
PUERTO CARRETO PANAMA 8.8N 77.6W 1652 03/17
SAN SALVADOR BAHAMAS 24.1N 74.5W 1652 03/17
LONG ISLAND BAHAMAS 23.3N 75.1W 1656 03/17
CAYMAN BRAC CAYMAN ISLANDS 19.7N 79.9W 1702 03/17

PUNTA CARIBANA COLOMBIA 8.6N 76.9W 1704 03/17

POTENTIAL IMPACTS

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

NEXT UPDATE AND ADDITIONAL INFORMATION

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

SS

SAMPLE TEXT PRODUCT

Message Number 2

EXPERIMENTAL TSUNAMI MESSAGE NUMBER 2
NOT FOR DISTRIBUTION
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1425 UTC THU MAR 17 2016

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

UPDATES

* THE ESTIMATED MAGNITUDE OF THE EARTHQUAKE IS REDUCED FROM
8.5 TO 8.4.

* FORECAST TSUNAMI AMPLITUDES ARE NOW INCLUDED.

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE 8.4
* ORIGIN TIME 1400 UTC MAR 17 2016
* COORDINATES 10.8 NORTH 66.0 WEST
* DEPTH 15 KM / 9 MILES
* LOCATION NEAR THE COAST OF VENEZUELA

EVALUATION

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.4 OCCURRED
NEAR THE COAST OF VENEZUELA AT 1400 UTC ON THURSDAY MARCH 17
2016.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE
FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST...UPDATED

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE
LEVEL ARE POSSIBLE ALONG SOME COASTS OF

GUADELOUPE... AND VENEZUELA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE
POSSIBLE ALONG SOME COASTS OF

ARUBA... COLOMBIA... DOMINICAN REPUBLIC... HAITI... PUERTO
RICO AND VIRGIN IS... ANGUILLA... ANTIGUA AND BARBUDA...
DOMINICA... GRENADA... JAMAICA... MARTINIQUE...
MONTserrat... CURACAO... BONAIRE... SAINT KITTS AND
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT
BARTHELEMY... SAINT MARTIN... SAINT VINCENT AND THE
GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL
ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... GUYANA... MEXICO... NICARAGUA...
PANAMA... BARBADOS... AND TURKS AND CAICOS ISLANDS.

* NON-HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR ALL OTHER
AREAS COVERED BY THIS MESSAGE.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST
AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL
FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS
WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

SAMPLE TEXT PRODUCT

*FOR OTHER AREAS COVERED BY THIS PRODUCT A FORECAST HAS NOT YET BEEN COMPUTED. THE FORECAST WILL BE EXPANDED AS NECESSARY IN SUBSEQUENT PRODUCTS.

RECOMMENDED ACTIONS

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
----------	--------	-------------	----------

CUMANA	VENEZUELA	10.5N 64.2W	1438 03/17
MAIQUETIA	VENEZUELA	10.6N 67.0W	1448 03/17
ONIMA	BONAIRE	12.3N 68.3W	1455 03/17
WILLEMSTAD	CURACAO	12.1N 68.9W	1501 03/17
ORANJESTAD	ARUBA	12.5N 70.0W	1519 03/17
KINGSTOWN	SAINT VINCENT	13.1N 61.2W	1519 03/17
SAINT GEORGES	GRENADA	12.0N 61.8W	1519 03/17
CASTRIES	SAINT LUCIA	14.0N 61.0W	1524 03/17
FORT DE FRANCE	MARTINIQUE	14.6N 61.1W	1527 03/17
ROSEAU	DOMINICA	15.3N 61.4W	1529 03/17
BASSE TERRE	GUADELOUPE	16.0N 61.7W	1532 03/17
SANTO DOMINGO	DOMINICAN REP	18.5N 69.9W	1538 03/17
CABO ENGANO	DOMINICAN REP	18.6N 68.3W	1543 03/17
PLYMOUTH	MONTserrat	16.7N 62.2W	1544 03/17

BASSETTERRE	SAINT KITTS	17.3N 62.7W	1545 03/17
BRIDGETOWN	BARBADOS	13.1N 59.6W	1548 03/17
JACAMEL	HAITI	18.1N 72.5W	1552 03/17
PIRATES BAY	TRINIDAD TOBAGO	11.3N 60.6W	1553 03/17
SIMPSON BAAI	SINT MAARTEN	18.0N 63.1W	1554 03/17
RIOHACHA	COLOMBIA	11.6N 72.9W	1605 03/17
BARRANQUILLA	COLOMBIA	11.1N 74.9W	1611 03/17
PUERTO PLATA	DOMINICAN REP	19.8N 70.7W	1613 03/17
THE VALLEY	ANGUILLA	18.3N 63.1W	1614 03/17
SAINT JOHNS	ANTIGUA	17.1N 61.9W	1618 03/17
PALMETTO POINT	BARBUDA	17.6N 61.9W	1624 03/17
SAINT BARTHELEMY	SAINT BARTHELEMY	17.9N 62.8W	1625 03/17
GRAND TURK	TURKS N CAICOS	21.5N 71.1W	1627 03/17
CARTAGENA	COLOMBIA	10.4N 75.6W	1628 03/17
CAP HAITEN	HAITI	19.8N 72.2W	1629 03/17
SANTIAGO D CUBA	CUBA	19.9N 75.8W	1631 03/17
BAIE BLANCHE	SAINT MARTIN	18.1N 63.0W	1632 03/17
KINGSTON	JAMAICA	17.9N 76.9W	1635 03/17
WEST CAICOS	TURKS N CAICOS	21.7N 72.5W	1638 03/17
ALIGANDI	PANAMA	9.2N 78.0W	1645 03/17
MONTEGO BAY	JAMAICA	18.5N 77.9W	1647 03/17
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N 61.5W	1649 03/17
SANTA MARTA	COLOMBIA	11.2N 74.2W	1652 03/17
PUERTO CARRETO	PANAMA	8.8N 77.6W	1652 03/17
PUNTA CARIBANA	COLOMBIA	8.6N 76.9W	1704 03/17
JEREMIE	HAITI	18.6N 74.1W	1713 03/17
PUNTO FIJO	VENEZUELA	11.7N 70.2W	1715 03/17
PUERTO OBALDIA	PANAMA	8.7N 77.4W	1716 03/17
CIENFUEGOS	CUBA	22.0N 80.5W	1725 03/17
PUERTO LIMON	COSTA RICA	10.0N 83.0W	1729 03/17
COLON	PANAMA	9.4N 79.9W	1749 03/17
BOCAS DEL TORO	PANAMA	9.4N 82.2W	1803 03/17
COZUMEL	MEXICO	20.5N 87.0W	1811 03/17
PUNTA GORDA	NICARAGUA	11.4N 83.8W	1815 03/17
PORT AU PRINCE	HAITI	18.5N 72.4W	1816 03/17
GOLFO VENEZUELA	VENEZUELA	11.4N 71.2W	1855 03/17
SANTA CRZ D SUR	CUBA	20.7N 78.0W	1930 03/17
PORLAMAR	VENEZUELA	10.9N 63.8W	1931 03/17
GEORGETOWN	GUYANA	6.8N 58.2W	2014 03/17
NUEVA GERONA	CUBA	21.9N 82.8W	2055 03/17
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2154 03/17

POTENTIAL IMPACTS

SAMPLE TEXT PRODUCT

- * A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

- * IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

- * IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

- * PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

NEXT UPDATE AND ADDITIONAL INFORMATION

- * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

- * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

- * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

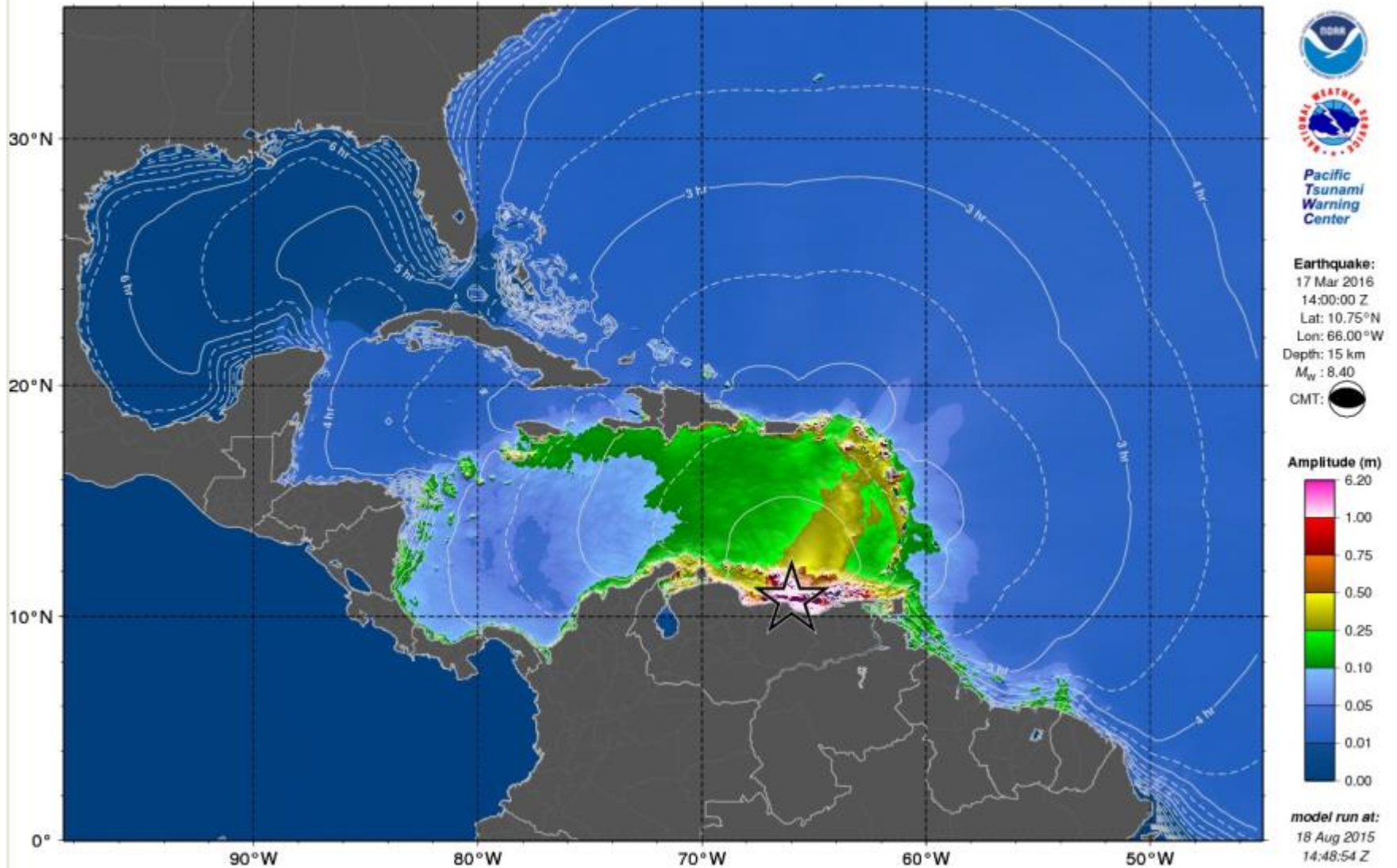
- * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

- * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

DEEP-OCEAN FORECAST MAP

PTWC Energy Forecast

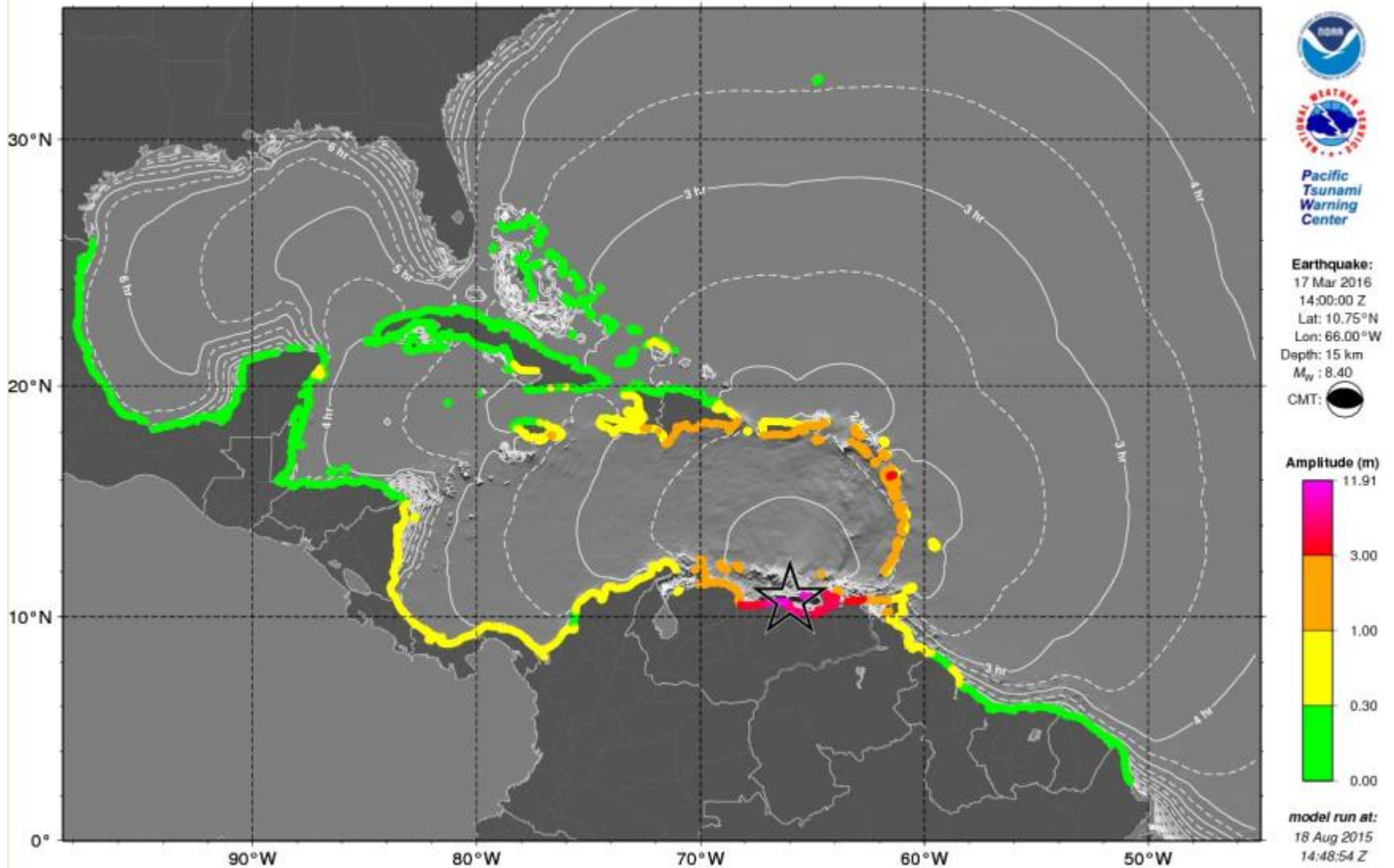
EXPERIMENTAL - Not For Distribution



COASTAL FORECAST MAP

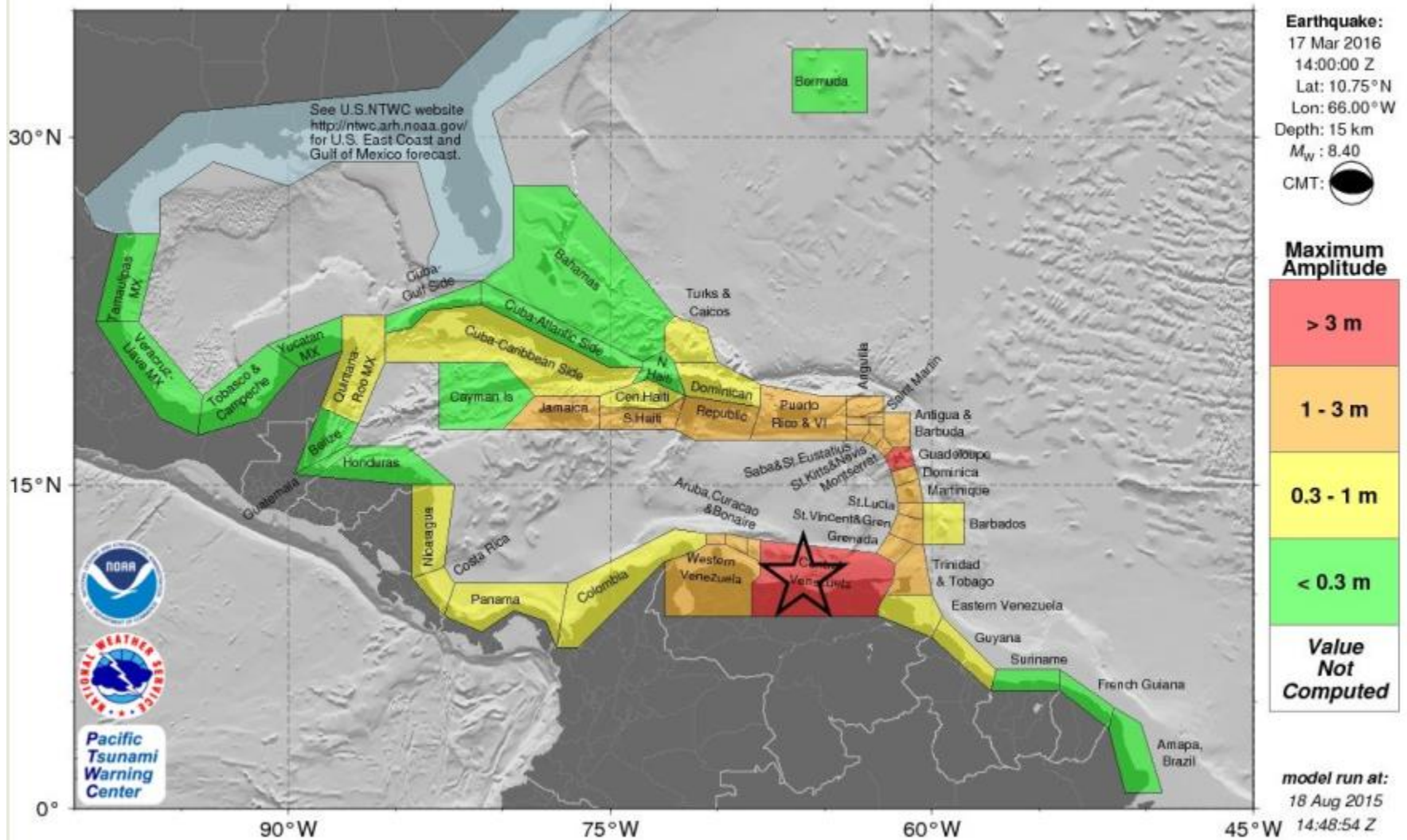
PTWC Coastal Forecast

EXPERIMENTAL - Not For Distribution

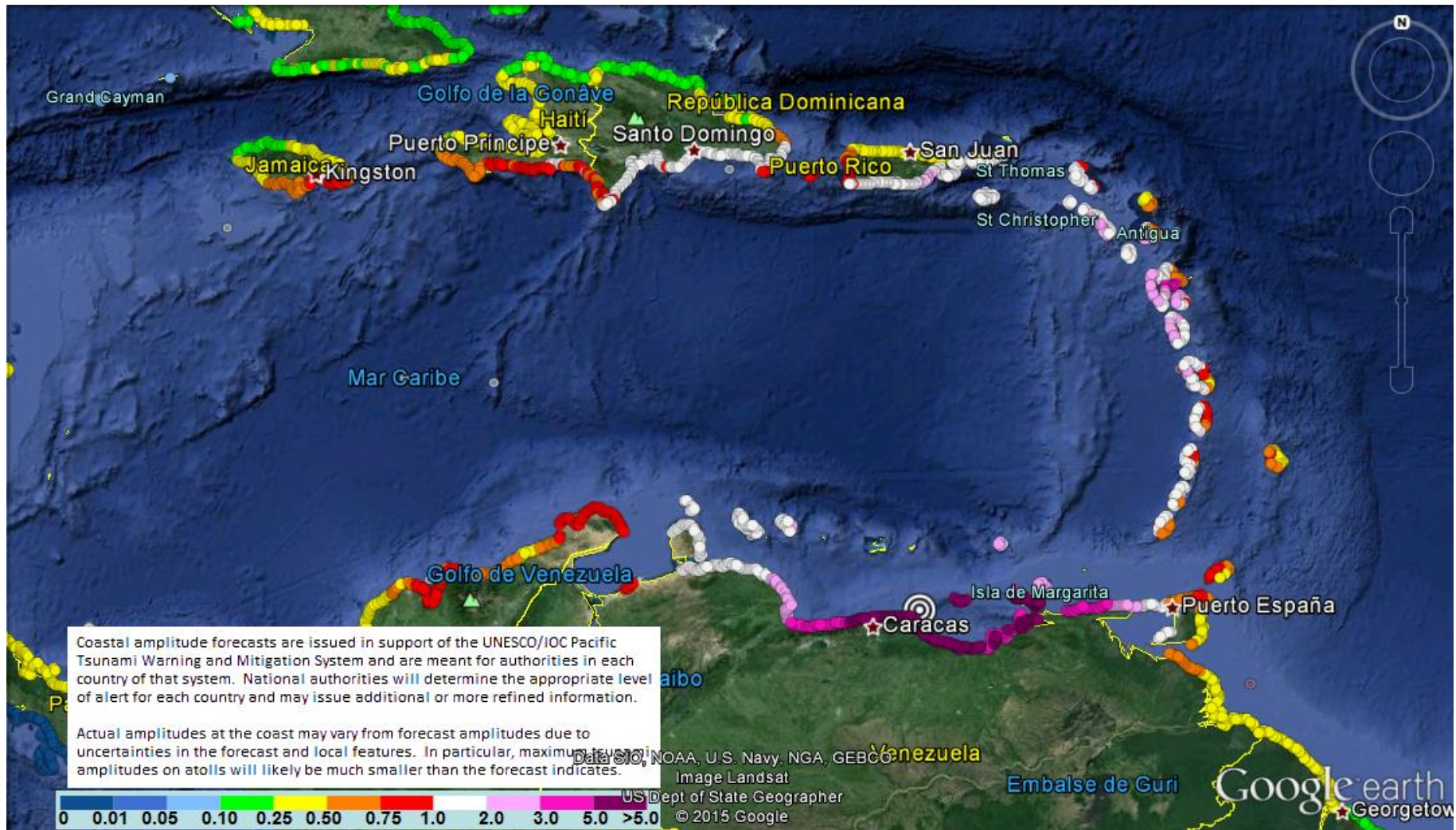


COASTAL FORECAST POLYGONS MAP

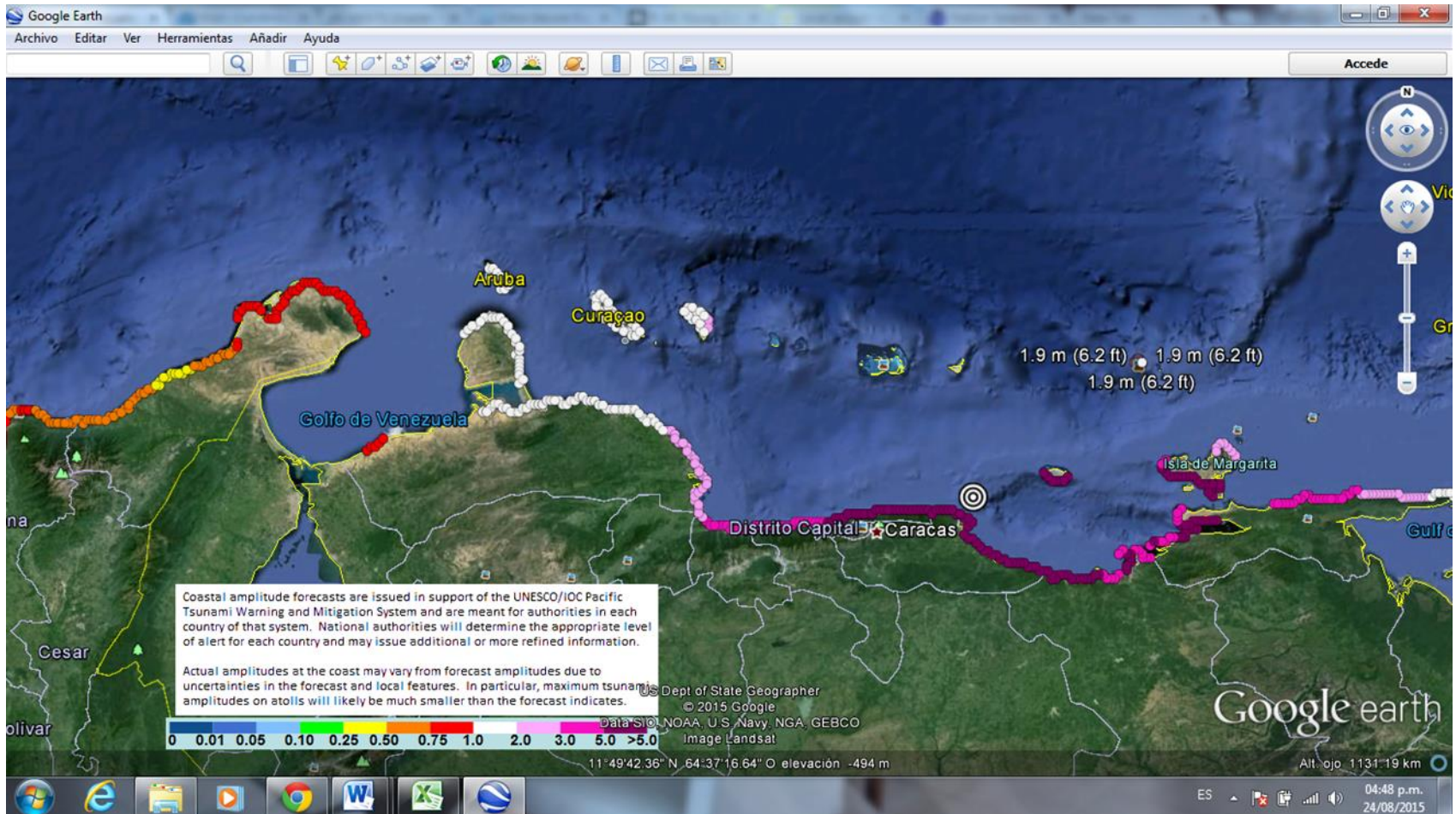
PTWC Forecast Polygons *EXPERIMENTAL - Not For Distribution*



KMZ FILE VIEWED WITH GOOGLE EARTH



ZOOM of KMZ FILE VIEWED WITH GOOGLE EARTH



SAMPLE STATISTICS TABLE

EXPERIMENTAL - NOT FOR DISTRIBUTION

PTWC RIFT Tsunami Forecast Model - Run ID: 20150818144854

Earthquake - Origin: 03/17/2016 14:00:00 UTC Coordinates: 10.8N 66.0W Depth: 015km Magnitude: 8.4

Coastal Forecast (meters)				Offshore Forecast (meters)				Total	Region Name
Maximum	Mean	Median	STD	Maximum	Mean	Median	STD	Points	
12.00	5.40	5.10	2.30	6.20	2.30	2.00	1.30	244	Central_Coast_of_Venezuela
3.10	2.00	2.00	0.73	1.50	0.67	0.65	0.29	71	Guadeloupe
2.80	1.80	1.60	0.53	6.10	1.50	1.20	0.98	100	Western_Coast_of_Venezuela
2.60	1.80	1.80	0.44	0.85	0.47	0.46	0.13	31	Dominica
2.50	1.20	0.74	0.75	2.10	0.93	0.66	0.58	28	Antigua_and_Barbuda
2.50	2.00	1.90	0.27	1.50	0.60	0.54	0.24	29	Saint_Kitts_and_Nevis
2.40	1.00	1.10	0.53	1.90	0.56	0.48	0.38	189	Puerto_Rico_and_Virgin_Is
2.30	1.60	1.50	0.40	1.70	0.85	0.83	0.41	15	Bonaire
2.30	1.50	1.80	0.56	1.90	0.60	0.49	0.32	41	Martinique
2.20	1.50	1.50	0.24	0.64	0.40	0.36	0.11	8	Saba_and_Saint_Eustatius
2.20	1.80	1.80	0.20	0.79	0.50	0.45	0.12	11	Montserrat
1.90	1.30	1.40	0.43	1.10	0.40	0.36	0.19	26	Saint_Lucia
1.90	1.40	1.40	0.23	0.70	0.46	0.45	0.13	27	Curacao
1.50	1.20	1.20	0.19	1.40	0.51	0.46	0.23	148	Caribbean_Coast_of_Dominican_Republic
1.50	1.20	1.30	0.20	0.79	0.68	0.70	0.08	6	Saint_Barthelémy
1.50	1.40	1.50	0.06	1.30	0.79	0.73	0.32	6	Sint_Maarten
1.40	1.00	1.10	0.28	1.10	0.45	0.35	0.23	29	Grenada
1.40	1.20	1.20	0.21	0.99	0.40	0.33	0.18	33	Saint_Vincent_and_the_Grenadines
1.40	1.10	1.20	0.31	1.60	1.10	1.10	0.27	8	Anguilla
1.30	1.20	1.20	0.05	0.68	0.46	0.42	0.11	8	Aruba
1.30	1.30	1.30	0.00	1.30	1.20	1.10	0.08	3	Saint_Martin
1.20	0.72	0.66	0.27	0.83	0.39	0.37	0.18	77	Trinidad_and_Tobago
1.10	0.47	0.45	0.24	0.67	0.19	0.13	0.14	146	Jamaica
1.10	0.76	0.78	0.16	0.71	0.25	0.22	0.12	89	Caribbean_Coast_of_Haiti
1.00	0.54	0.51	0.22	0.94	0.36	0.31	0.17	255	Caribbean_Coast_of_Colombia
0.89	0.60	0.62	0.15	0.31	0.19	0.19	0.06	22	Barbados
0.71	0.26	0.23	0.11	1.50	0.14	0.09	0.19	129	Atlantic_Coast_of_Dominican_Republic
0.55	0.48	0.48	0.04	0.28	0.18	0.18	0.04	48	Caribbean_Coast_of_Costa_Rica
0.50	0.45	0.46	0.03	0.45	0.19	0.18	0.06	82	Atlantic_Coast_of_Venezuela
0.49	0.41	0.40	0.04	0.41	0.19	0.17	0.06	179	Caribbean_Coast_of_Panama
0.47	0.40	0.41	0.03	0.29	0.15	0.15	0.06	139	Caribbean_Coast_of_Nicaragua
0.45	0.36	0.37	0.05	0.26	0.10	0.09	0.04	139	Gulf_of_Gonave_Coast_of_Haiti
0.37	0.27	0.28	0.03	0.26	0.15	0.14	0.04	101	Guyana
0.36	0.21	0.15	0.10	0.14	0.07	0.07	0.03	46	Turks_and_Caicos_Islands
0.35	0.15	0.14	0.09	0.14	0.05	0.05	0.03	166	Quintana_Roo_Mexico
0.31	0.16	0.14	0.08	0.14	0.05	0.04	0.02	472	Caribbean_Coast_of_Cuba
0.30	0.22	0.21	0.04	0.14	0.06	0.06	0.02	66	Atlantic_Coast_of_Haiti
0.27	0.15	0.16	0.03	0.32	0.10	0.08	0.06	84	French_Guiana
0.27	0.24	0.24	0.01	0.34	0.15	0.14	0.06	109	Suriname
0.25	0.12	0.16	0.07	0.09	0.03	0.04	0.02	267	Atlantic_Coast_of_Cuba
0.23	0.11	0.09	0.04	0.24	0.04	0.03	0.02	442	Bahamas
0.20	0.16	0.17	0.02	0.12	0.07	0.07	0.02	90	Belize
0.19	0.13	0.12	0.02	0.19	0.06	0.05	0.02	185	Caribbean_Coast_of_Honduras
0.19	0.18	0.18	0.00	0.07	0.06	0.06	0.01	13	Caribbean_Coast_of_Guatemala
0.16	0.15	0.16	0.00	0.14	0.08	0.06	0.04	7	Bermuda
0.14	0.05	0.02	0.04	0.13	0.02	0.01	0.02	1071	Mainland-Gulf
0.11	0.03	0.03	0.01	0.02	0.01	0.01	0.00	119	Gulf_of_Mexico_Coast_of_Cuba
0.10	0.10	0.10	0.00	0.14	0.05	0.05	0.03	64	Amapa_Brazil
0.09	0.09	0.09	0.01	0.05	0.04	0.03	0.01	5	Cayman_Islands
0.06	0.02	0.01	0.02	0.02	0.00	0.00	0.01	59	Yucatan_Mexico
0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	126	Tamaulipas_Mexico
0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	152	Veracruz_Mexico
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	181	Tabasco_and_Campeche_Mexico

RIFT Limitations

1. For small islands (e.g., islands generally less than 30 km in diameter), Green's Law can overestimate the coastal amplitude. In those cases, a forecast amplitude between the offshore and Green's Law amplitude may be more appropriate.

RIFT Limitations

2. For resonant harbors, the Green's Law amplitude can underestimate the actual wave amplitude. Green's Law amplitude should be interpreted as average wave amplitude at the open coast, not necessarily the maximum amplitude inside a harbor or at a sea-level gauge.

RIFT Limitations

3. The RIFT forecast coastal amplitude is not necessarily indicative of inundation depth, which is a function of the local topography. A 30-meter coastal amplitude from Green's Law does not mean the inundation depth will reach 30 meters. But it does indicate a very major tsunami impact.

RIFT Limitations

4. In the near field, Green's law amplitude does not necessarily take into account wave propagation and dissipation. Thus, a coastal amplitude of 20-30 meters can be misleading, it should also simply be interpreted as a major tsunami.

Dissemination Systems

- Current Text Products (thru Feb. 29, 2016) - GTS, AFTN, Email (only TWFP and TWC), Fax (only TWFP and TWC), Website, IOC Message System, Tsunami Bulletin Board, etc.
- Enhanced Products (October 1, 2015-February 29, 2016) – text messages, 3 Figures, kmz file and statistics **only by email to TWFP and TWCs**
- Enhanced Products (As of March 1, 2016)
 - **Text – Public**, Email (only TWFP and TWC), Fax (only TWFP and TWC), Website, IOC Tsunami Message System, Tsunami Bulletin Board, GTS, AISR, EMWIN.
 - **Graphical Products**, kmz file and statistics - **only by email to TWFP and TWCs**

WARNING - REMINDER

- All enhanced PTWC products to be issued in parallel with existing products (as of Oct. 1, 2015) and enhanced graphical products, KMZ and statistics tables (as of March 1, 2016) are **only for the internal use of TWFP/TWC**, NOT for further dissemination (no media, no social media, no other stakeholders), they are for decision support, not for public...

Next Steps

- Presentation available on CARIBEWAVE.INFO
- Review the TWFP/TWC contact information, especially email addresses, IOC Tsunami Website TWFP/TNC
 - Username: tsunami
 - PWD: bigwave
- Advise staff, no further dissemination of Enhanced Products
- Changes to TWFP/TWC contact information must be sent to b.aliaga@unesco.org

Questions

Thank you
